at least one pressure sensor having first and second pressure inlets;

measurement circuitry coupled to the at least one pressure sensor and configured to provide a sensor output related to differential pressure between the first and second pressure inlets;

a controller coupled to the measurement circuitry and the loop communicator, the controller adapted to provide a process variable output to the loop communicator, the process variable output related to the sensor output; and

a differential pressure measurement probe adapted for placement within the fluid-carrying conduit, the probe including:

a first plenum coupled to the first pressure inlet, the first plenum including a longitudinally extending impact surface with at least one impact aperture disposed to communicate pressure from the impact surface to the first pressure inlet;

a non-impact surface spaced from the impact surface, the non-impact surface having a non-impact aperture disposed to communicate pressure from the non-impact surface to the second pressure inlet.

20. (Amended) A differential pressure measuring probe adapted for diametric placement within a fluid-carrying conduit, comprising,

a body having an upstream facing impact surface and at least one downstream non-impact surface, where the upstream facing impact surface is substantially flat and adapted to be disposed perpendicularly to the direction of fluid flow in the conduit,

at least one fluid pressure transmitting plenum within the body, and

at least one opening in the flat upstream facing impact surface of the body, establishing fluid communication between the fluid in the conduit and the at least one fluid pressure transmitting plenum, whereby the flat upstream facing impact surface of the probe body creates a relatively quiescent stagnation area upstream of the probe.

3 21. (Amended) The probe of claim 20 and further comprising,

at least one non-impact fluid pressure transmitting plenum within the body, and

at least one opening in the at least one non-impact surface of the body establishing fluid communication between the fluid in the conduit and the at least one non-impact fluid pressure transmitting plenum.

4 22. (Amended) The probe of claim 21 where the body includes a longitudinally extending and downstream extending hollow rib portion having at least one of the non-impact surfaces and containing therein the at least one fluid pressure transmitting plenum.

5 23. (Amended) The probe of claim 20 where the downstream non-impact surface is substantially flat and parallel to the flat upstream facing impact surface.

24. The probe of claim 21 where the downstream non-impact surface is substantially flat and parallel to the flat upstream facing impact surface and where the at least one opening in the downstream surface is in the said substantially flat non-impact surface.

25. The probe of claim 21 where the body includes,

a pair of spaced apart downstream extending legs, each having a downstream non-impact surface.

26. The probe of claim 25 where the legs are hollow and have a plurality of bounding walls and where the at least one fluid pressure transmitting plenum is contained within the walls and where the at least one opening is in at least one wall.

27. The probe of claim 20 where the at least one opening is a longitudinally extending slot having a length greater than its width.

28. (Amended) A differential pressure measuring probe adapted for placement within a fluid-carrying conduit, comprising,

a bluff body having a width and a flat upstream facing fluid impact surface coextensive with the width of the body, whereby a localized region

of total fluid pressure is created in the fluid across the width of the bluff body.

29. The probe of claim 28, and further including,

at least one opening in the said impact surface, and

a fluid carrying channel in communication with the at least one opening for transmitting the said total fluid pressure exteriorly of the conduit.

30. The probe of claim 28 where the flat upstream facing impact surface is adapted to be positioned perpendicularly to the direction of fluid flow in the conduit.

31. A method of measuring differential pressure in the flowing fluid within a closed conduit as a factor in determining the rate of fluid flow in the conduit, comprising,

creating an upstream zone of relatively quiescent stagnation within the flowing fluid proximate the flat upstream facing surface of a bluff body positioned in the flowing fluid perpendicularly to the direction of fluid flow;

detecting the total pressure of the fluid at the flat upstream facing surface of the bluff body, and

communicating the total pressure to a pressure sensor.

32. The method of claim 31 and further including,

creating a downstream zone of relatively quiescent fluid stagnation downstream of the flat upstream facing surface of the bluff body,

detecting the static pressure of the fluid in the downstream fluid stagnation zone, and

communicating the static pressure to a pressure sensor.

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33. (New) The bluff body of a differential pressure measurement probe for diametric placement within a fluid-carrying conduit, the bluff body comprising,

a housing having a longitudinal extent and a width defining a fluid impact surface that is substantially flat across the width, the fluid impact surface adapted to face upstream in the fluid conduit substantially normal to the direction of fluid flow, for creating a dome of high fluid pressure thereacross, said housing including,

high fluid pressure conduit means, and

at least one aperture providing fluid communication between the impact surface and the high fluid pressure conduit means.

34. (New) The bluff body of claim 33 where the housing includes,

fluid non-impact surface means.

17 ~~35~~. (New) The bluff body of claim ~~34~~ 16 and further including,

at least one low fluid pressure plenum, and

at least one aperture providing fluid communication between the fluid non-impact surface means and the low fluid pressure plenum.

18 ~~36~~. (New) The bluff body of claim ~~33~~ 15 where the housing includes a projecting rib having longitudinal and depth aspects and where the rib depth aspect is oriented perpendicularly to the fluid impact surface and is adapted to be disposed parallel to the direction of fluid flow in the conduit and where the longitudinal aspect of the rib substantially corresponds to the longitudinal extent of the flat fluid impact surface means.

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19 ~~37~~. (New) The bluff body of claim ~~35~~ 17 where the housing includes a projecting rib having longitudinal and depth aspects and where the rib depth aspect is oriented perpendicularly to the fluid impact surface and is adapted to be disposed parallel to the direction of fluid flow in the conduit and where the longitudinal aspect of the rib substantially corresponds to the longitudinal extent of the flat fluid impact surface means.

38. (New) The bluff body of claim 33 where the high fluid pressure conduit means comprises a plenum within the housing and further including,

aperture means in the plenum disposed to fluidly communicate with the at least one aperture providing fluid communication between the impact surface and the high fluid pressure conduit means.

39. (New) The bluff body of claim 35 where the high fluid pressure conduit means comprises a plenum within the housing and further including,

aperture means in the plenum disposed to fluidly communicate with the at least one aperture providing fluid communication between the impact surface and the high fluid pressure conduit means.

40. (New) The bluff body of claim 35 where the at least one low fluid pressure plenum comprises a pair of spaced apart low fluid pressure plenums attached to the housing and where the respective fluid non-impact surface means diverge angularly from a line that is perpendicular to the fluid impact surface means.

41. (New) A system for measuring the rate of fluid flow in a conduit and communicating the data to a process control loop, comprising,

a differential pressure measurement probe having a bluff body for diametric placement within the conduit, said body having,

fluid impact surface means having longitudinal and width extents, for creating a dome of high fluid pressure thereacross,

a high fluid pressure plenum having an interior space,

at least one impact aperture means for providing fluid communication between the impact surface and the interior space of the high fluid pressure plenum, and where the fluid impact surface is substantially flat across the extent of its width, extending bilaterally beyond the at least one aperture means and adapted to face upstream in the fluid conduit substantially normal to the direction of fluid flow,

fluid non-impact surface means,

at least one low fluid pressure plenum having an interior space,

at least one non-impact aperture means for providing fluid communication between the fluid non-impact surface and the interior space of the at least one low fluid pressure plenum,

a process transmitter, including,

a pressure sensor having first and second pressure inlets connected respectively to the high and low pressure plenums,

measurement means coupled to the pressure sensor for providing an electrical output related to the differential pressure between the first and second pressure inlets, and

a loop communicator coupled to the measurement means for providing fluid flow rate data to the control loop.